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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/619,669	07/19/2000	Yasuyuki Morishita	DP-652 US	2152

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EXAMINER
NGUYEN, DILINH P

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 05/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/619,669	MORISHITA, YASUYUKI	
	Examiner	Art Unit	
	DiLinh Nguyen	2814	

-- The MAILING DATE of this communication appears on the cover sheet with th correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-12,14,16,17 and 19-27* is/are rejected.

7)☒ Claim(s) *3,13,15 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *13* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase: "...said third diffusion layer being fabricated at other than a bottom of said first diffusion layer..." is not understood.

The third diffusion layer being fabricated at other, what is the other? Other diffusion? Other region?

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Uchikoba et al. (U.S. Pat. 6320229).

Uchikoba et al. disclose a semiconductor device (figs. 5-6, column 9, lines 28 et seq.) for a semiconductor IC having a substrate 10 of a first conduction type (P type), an

internal circuit, an input/output terminal, electrode wiring, and signal wiring, the device comprising:

a first diffusion layer 21 fabricated in a region of the first conduction type of the semiconductor substrate, the layer having a second conduction type (N type) opposite the first conduction type and being connected to the input/output terminal;

a second diffusion layer 24 of the second conduction type being held at a predetermined potential; and

a third diffusion layer 34 of the second conduction type fabricated at a bottom of the second diffusion layer, the third diffusion layer being connected to the second diffusion layer, the third diffusion layer being fabricated at the bottom of the diffusion layer 24 than a bottom of the first diffusion layer,

the first diffusion layer 21 being circularly enclosed with the second diffusion layer 24 and the third diffusion layer 34 (fig. 6).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchikoba et al. in view of Nakazato et al. (U.S. Pat. 5324982).

Uchikoba et al. fail to disclose a fourth diffusion layer having an impurity concentration higher than that of the semiconductor substrate.

Nakazato et al. a region of the first conduction type (P-type) of the semiconductor substrate 100 includes a diffusion layer 102 having an impurity concentration higher than that of the semiconductor substrate (fig. 16). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Uchikoba et al. to act as a shield to prevent minority carriers from entering the memory cell and or from entering the semiconductor region electrically connected to the bit line, as shown by Nakazato et al.

5. Claims 2, 4-12, 14, 16-17 and 19-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchikoba et al. in view of Applicant's Admitted Prior Art (figs. 5A-5B).

- Regarding claim 21, Uchikoba et al. disclose the claimed invention except for a fourth region having the first conduction type.

Applicant's Admitted Prior Art (figs. 5A-5B) disclose a diffusion layer 102 surrounded by the substrate 101 and the first and second regions, wherein the layer 102 having the first conduction type (P-type). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Uchikoba et al. to act as a shield to prevent minority carriers from entering the memory cell and to prevent soft errors ascribable to the minority carriers.

- Regarding claim 2, Applicant's Admitted Prior Art (figs. 5A-5B) disclose the region of the first conduction type (P-type) of the semiconductor substrate includes a diffusion layer 102.

- Regarding claim 4, it is conventional in the art to find the optimal thickness of the diffusion layer through routine and obvious experimentation. It would have been obvious to one having ordinary skill to find the optimal thickness of the diffusion layer since it is desirable to form devices that are structurally and electrically sound.
- Regarding claims 5, 14, 16 and 27, Applicant's Admitted Prior Art (figs. 5A-5B) disclose a lateral, bipolar transistor including the first diffusion layer as a collector, the second diffusion layers as an emitter, and the region of the first conduction type (P) or the diffusion layer 102 as a base is put to operation.
- Regarding claims 6 and 17 and 19-20, Applicant's Admitted Prior Art (figs. 5A-5B) disclose wherein the first and second diffusion layers 104 and 105 are isolated form each other by a device separating isolation layer 103 on a surface of the substrate.
- Regarding claims 7-8 and 24, Applicant's Admitted Prior Art (figs. 5A-5B) disclose the layers 104 and 105 are manufactured with a CMOS gate electrode disposed on a surface of the substrate and obvious in a circular shape.
- Regarding claims 9-10, it would have been obvious and matter of design choice to form the gate electrode is connected to the signal wiring of the internal circuit of the semiconductor IC and fixed to a predetermined potential.
- Regarding claim 11, Applicant's Admitted Prior Art (figs. 5A-5B) disclose the first conduction type is a p type and the second conduction type is an n type; and the predetermined potential is a ground potential.

- Regarding claim 12, it would have been obvious and matter of design choice to one having ordinary skill in the art.
- Regarding claim 22, Applicant's Admitted Prior Art discloses an impurity concentration of the layer 102 decreases in a direction away from the first region.
- Regarding claim 23, Applicant's Admitted Prior Art discloses the second region 105 is connected to a first constant electrical potential ground terminal 108.
- Regarding claim 25, Applicant's Admitted Prior Art (figs. 5A-5B) disclose a diffusion region 106 having first conduction type (P) and connected to the ground terminal 9.
- Regarding claim 26, Applicant's Admitted Prior Art discloses an output/ input terminal 107.

Allowable Subject Matter

Claims 3, 13, 15 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers

for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN
May 6, 2003